Listing of the Claims

1. (Currently Amended) A diagnostic imaging system which automatically corrects metal artifacts in an uncorrected tomographic image caused by high attenuating objects, the system comprising:

a means for filtering the uncorrected tomographic image to reduce and harmonize noise;

a means for clustering pixels of the filtered uncorrected tomographic image, which clustering means includes:

a means for classifying pixels of the filtered uncorrected reconstructed image into at least metal, bone, tissue, and air pixel classes to generate a classified image;

~~a means for replacing metal class pixels of the classified image with pixel~~ values of another pixel class to generate a metal free classified image;

a means for forward projecting the metal free classified image to generate a model projection data;

a means for identifying corrupted regions of original projection data contributing to the pixels of the metal class; and

a means for replacing the identified corrupted regions with corresponding regions of the model projection data to generate corrected projection data which is reconstructed by a reconstruction means into a corrected reconstructed image.

2. (Previously Presented) The system as set forth in claim 1, further including:

a morphological means for using prior knowledge to refine class regions of the metal free classified image.

3. (Previously Presented) The system as set forth in claim 2, wherein the morphological means removes at least one of bubbles, points, and sharp edges from the metal free classified image.

4. (Previously Presented) The system as set forth in claim 1, further including:

a k-means for providing at least one of a class definition, number of classes, and initial grayscale value for each class.

5. (Previously Presented) The system as set forth in claim 1, wherein the clustering means uses one of k-mean classifier, c-mean classifier, fuzzy c-mean classifier, and unsupervised Bayesian classifier cluster pixels into the classes.

6. (Previously Presented) The system as set forth in claim 1, wherein the clustering means receives the reconstructed image for iteratively improving the corrected reconstructed image.

7. (Previously Presented) The system as set forth in claim 6, wherein the clustering means refines correction of the metal artifacts by iteratively modifying at least one of a class definition, number of classes and an initial grayscale value of at least one class.

8. (Previously Presented) The system as set forth in claim 1, further including:

a user input means by which a user defines at least one of a class definition, number of classes and an initial value of at least one class.

9. (Previously Presented) The system as set forth in claim 1, wherein the corrupted regions replacing means interpolatively adjusts the model projection data to smooth transitions between the model projection data and the projection data.

10. (Currently Amended) A method for automatically correcting metal artifacts in an uncorrected tomographic image caused by high attenuating objects, comprising:

filtering the uncorrected tomographic image to reduce and harmonize noise;

clustering pixels of the filtered uncorrected tomographic image;

classifying pixels of the filtered uncorrected reconstructed image into at least metal, bone, tissue, and air pixel classes to generate a classified image;

replacing metal class pixels of the classified image with pixel values of another pixel class to generate a metal free classified image;

forward projecting the metal free classified image to generate a model projection data;

identifying corrupted regions of original projection data contributing to the pixels of the metal class;

replacing the identified corrupted regions with corresponding regions of the model projection data to generate corrected projection data; and

reconstructing the corrected projection data into a corrected reconstructed image.

11. (Original) The method as set forth in claim 10, wherein the pixels are clustered iteratively by a use of an iterative classifier function.

12. (Original) The method as set forth in claim 11, wherein the classifier function is one of k-mean classifier, c-mean classifier, fuzzy c-mean classifier, and unsupervised Bayesian classifier.

13. (Previously Presented) The method as set forth in claim 10, further including:

using prior knowledge to refine class regions of the metal free classified image.

14. (Previously Presented) The method as set forth in claim 10, further including:

removing at least one of bubbles, points, and sharp edges from the metal free classified image.

15. (Previously Presented) The method as set forth in claim 10, wherein the reconstructing the corrected projection data into the corrected reconstructed image includes:

reconstructing the corrected projection data using filtered backprojection.

16. (Previously Presented) The method as set forth in claim 10, wherein the original projection data is reconstructed by applying Radon transform to the uncorrected tomographic image and the corrupted regions are identified and replaced in the reconstructed original projection data.

17. (Previously Presented) A diagnostic imaging system including:

a reconstruction processor which reconstructs projection data into a reconstructed image;

a filter which reduces and harmonizes noise of the uncorrected tomographic image

a classifying algorithm which classifies pixels of the uncorrected tomographic image at least into metal, bone, tissue, and air pixel classes;

a pixel replacement algorithm which replaces pixels of the reconstructed image that are classified into the metal class with pixel values of at least one other class to generate a metal free image;

a morphological algorithm which applies prior knowledge to the metal free image to refine classification regions of the metal free image based on known characteristics of subject anatomy;

a forward projection algorithm which forward projects the metal free image to generate model projection data; and

a replacement algorithm which replaces corrupted portions of the projection data which corrupted portions contribute to the pixels of the metal class with

corresponding portions of the model projection data to generate corrected projection data, which is reconstructed by the reconstruction processor into a corrected tomographic image.

18. (Previously Presented) A tomographic imaging system comprising:

a classifying algorithm which classifies pixels of an uncorrected tomographic image into at least metal, bone, tissue, and air pixel classes;

a pixel replacement algorithm which replaces pixels that are classified into the metal class with pixel values of at least one other class to generate a metal free tomographic image; and

a morphological algorithm which applies prior knowledge to the metal free image to refine classification regions of the metal free image based on known characteristics of subject anatomy.

19. (Previously Presented) The tomographic imaging system of claim 18, wherein the morphological algorithm removes at least one of bubbles, points, and sharp edges from the metal free image.

20. (Previously Presented) The tomographic imaging system of claim 18 further comprising:

a forward projection algorithm which forward projects the metal free image to generate model projection data; and

a replacement algorithm which replaces corrupted portions of the projection data which corrupted portions contribute to the pixels of the metal class with corresponding portions of the model projection data to generate corrected projection data, which is reconstructed by a reconstruction processor into a corrected tomographic image.